

Patent
Attorney's Docket No. 000600-033

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A process for the production of expandable thermoplastic microspheres comprising a step of contacting microspheres comprising a thermoplastic polymer shell encapsulating a propellant, said polymer shell being obtained by polymerising ethylenically unsaturated monomers, and further comprising residual monomers, with an agent reacting directly or indirectly with at least part of said residual monomers, wherein said agent is selected from the group consisting of oxo acids of sulfur, salts and derivatives thereof, comprising at least one sulfur atom having at least one free electron pair and binding three oxygen atoms.

2. (Currently Amended) A process for eliminating or reducing residual monomers from thermoplastic expandable microspheres comprising a thermoplastic polymer shell encapsulating a propellant, said polymer shell being obtained by polymerising ethylenically unsaturated monomers, and further comprising residual monomers, the process comprising a step of contacting said microspheres with an agent selected from the group consisting of oxo acids of sulfur, salts and derivatives thereof, comprising at least one sulfur atom having at least one free electron pair and binding three oxygen atoms.

Patent
Attorney's Docket No. 000600-033

3. (Original) A process as claimed in claim 1, wherein said agent is selected from the group consisting of bisulfites, sulfites and sulfurous acid.
4. (Original) A process as claimed in claim 2, wherein said agent is selected from the group consisting of bisulfites and sulfites.
5. (Original) A process as claimed in claim 1, wherein said agent is formed in situ from a precursor.
6. (Original) A process as claimed in claim 5, wherein said precursor is selected from the group consisting of disulfites, ditionites and sulfur dioxide.
7. (Original) A process as claimed in claim 1, wherein the expandable microspheres during the step of contacting them with the agent for reacting with residual monomers are in the form of an aqueous slurry or dispersion originating from a polymerisation mixture in which the microspheres have been produced.
8. (Original) A process as claimed in claim 1, wherein the residual monomers comprise at least one of acrylonitrile and methacrylonitrile.
9. (Original) A process as claimed in claim 1, wherein the thermoplastic polymer shell of the expandable microspheres is made from a homo- or co-polymer obtained by

Patent
Attorney's Docket No. 000600-033

polymerising ethylenically unsaturated monomers, of which the total amount of nitrile containing monomers is at least about 70 wt%.

10. (Original) A process as claimed in claim 2, wherein said agent is selected from the group consisting of bisulfites, sulfites and sulfurous acid.

11. (Original) A process as claimed in claim 10, wherein said agent is selected from the group consisting of bisulfites and sulfites.

12. (Original) A process as claimed in claim 2, wherein said agent is formed in situ from a precursor.

13. (Original) A process as claimed in claim 12, wherein said precursor is selected from the group consisting of disulfites, ditionites and sulfur dioxide.

14. (Original) A process as claimed in claim 2, wherein the expandable microspheres during the step of contacting them with the agent for reacting with residual monomers are in the form of an aqueous slurry or dispersion originating from a polymerisation mixture in which the microspheres have been produced.

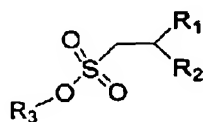
15. (Original) A process as claimed in claim 2, wherein the residual monomers comprise at least one of acrylonitrile and methacrylonitrile.

Patent
Attorney's Docket No. 000600-033

16. (Original) A process as claimed in claim 2, wherein the thermoplastic polymer shell of the expandable microspheres is made from a homo- or co-polymer obtained by polymerising ethylenically unsaturated monomers, of which the total amount of nitrile containing monomers is at least about 70 wt%.

17. (Currently Amended) Expandable thermoplastic microspheres comprising a thermoplastic polymer shell encapsulating a propellant, said polymer shell being obtained by polymerising ethylenically unsaturated monomers, and further comprising at least one non-polymeric reaction product of at least one monomer used for the polymer shell and an agent selected from the group consisting of oxo acids of sulfur, salts and derivatives thereof, comprising at least one sulfur atom having at least one free electron pair and binding three oxygen atoms.

18. (Currently Amended) Expandable thermoplastic microspheres comprising a thermoplastic polymer shell encapsulating a propellant, said polymer shell being obtained by polymerising ethylenically unsaturated monomers, and further comprising at least one reaction product compound selected from the group consisting of salts and derivatives of sulfonic acid anion as defined in any one of Formula I:



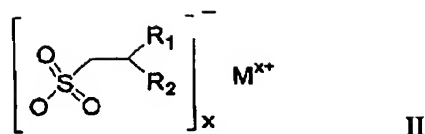
I

where R₁ is a nitrile, carboxy ester, carboxy amide, carboxy acid or aryl group, and R₂ and R₃, independently of each other, is hydrogen or an alkyl group;

Patent
Attorney's Docket No. 000600-033

or

Formula II:



where R₁ is a nitrile, carboxy ester, carboxy amide, carboxy acid or aryl group, R₂ is a hydrogen or alkyl group, and M^{x+} is a cation having a valency of x.

19. (Original) Expandable thermoplastic microspheres as claimed in claim 18, wherein said salt or derivative of sulfonic acid anion is selected from the group consisting of 2-cyano-ethanesulfonic acid, 2-cyano-2-methyl-ethanesulfonic acid, 2-aryl-ethanesulfonic acid, 2-methoxycarbonyl-ethanesulfonic acid, 2-methoxycarbonyl 2-methyl-ethanesulfonic acid, 2-carboxy-ethanesulfonic acid, 2-carbamoyl-ethanesulfonic acid, 2-cyano-ethanesulfonic acid methyl ester, 2-cyano-2-methyl-ethanesulfonic acid methyl ester, 2-methoxycarbonyl-ethanesulfonic acid methyl ester, 2-methoxycarbonyl-2-methyl-ethanesulfonic acid methyl ester, 2-carboxy-ethanesulfonic acid methyl ester, sodium, potassium, magnesium and ammonium salts of any one of 2-cyano-ethanesulfonate, 2-cyano-2-methyl-ethanesulfonate, 2-aryl-ethanesulfonate, 2-methoxycarbonyl-ethanesulfonate, 2-methoxycarbonyl 2-methyl-ethanesulfonate, 2-carboxy-ethanesulfonate, and 2-carbamoyl-ethanesulfonate.

Patent
Attorney's Docket No. 000600-033

20. (Original) Expandable thermoplastic microspheres comprising a thermoplastic polymer shell encapsulating a propellant, said polymer shell being made of a homo- or co-polymer from ethylenically unsaturated monomers and total amount of nitrile containing monomers in the polymer shell is at least about 70 wt%, said microspheres comprising less than about 100 ppm residual nitrile containing monomers and having a brightness according to ISO 2470 of at least about 75%.